

## LETTERS TO THE EDITORS

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IN THE PRESENT CIRCUMSTANCES, PROOFS OF "LETTERS" WILL NOT BE SUBMITTED TO CORRESPONDENTS OUTSIDE GREAT BRITAIN.

## Classification of Sub-human Types

DURING the last fifteen years scarcely a year has passed but a new skull has been discovered of a type of primitive man or of a higher ape allied to man's ancestors. We are thus getting a large series of forms which have to be classified, and we are having much new light on the origin of man. Perhaps within a hundred years we may have all the main links between man and an anthropoid such as *Dryopithecus*, with dozens of forms in side branches, which have left no descendants. But a difficulty will arise in nomenclature.

If we have a line of forms from, say, a primitive Eocene horse like *Eohippus* to an Oligocene horse like *Meshippus* with every connecting link, are we to regard all as belonging to *Meshippus*?

Among the early human types a similar problem is arising. Zuckerman says, "At the present time there does not seem to be any more reason than there was ten years ago for separating generically from one another in classification such archaic types as *Sinanthropus*, *Pithecanthropus*, *Neanderthal* and *Rhodesian man*"<sup>1</sup>. If these four types are placed in the same genus, that genus will have to be *Homo*. Zuckerman further suggests that there is "no reason to regard Java man (*Pithecanthropus*) and Pekin man (*Sinanthropus*) as generically distinct. This view was reaffirmed last year by Le Gros Clark and has just been restated by von Koenigswald and Weidenreich".

Montandon, on the other hand, considers that *Pithecanthropus* stands outside the *Hominidæ*, while he regards *Sinanthropus* as a more advanced type which is definitely within the *Hominid* group. While such a difference of opinion exists it would surely be unwise to have the Pekin man called *Homo pekinensis* and placed in the *Hominidæ*, while an allied species of the same genus is called *Homo erectus* and placed in a different family.

It may be some years before we are in a position to state definitely the affinities of such types as *Pithecanthropus* and *Sinanthropus*, and even to be at all sure whether *Sinanthropus* is closely related to either *Neanderthal* man or *Rhodesian* man, and it seems to me nothing will be gained at present by putting all these four types in the genus *Homo*.

Further, to place *Pithecanthropus* in the genus *Homo* commits us to a definite conclusion which may or may not be correct; and, while the majority of anatomists at present agree in regarding *Pithecanthropus* as a primitive type of man, there are, and have always been, many who regard it as distinctly sub-human. Even should it prove to be the ancestor of man, I cannot see any reason why it should not be left as *Pithecanthropus*, while there are very definite objections to placing it in the genus *Homo*. *Pithecanthropus* with a brain of 800-950 c.c., an enlarged canine tooth in the male and a diastema in front of

it, may belong to the same genus as *Dean Swift* with a brain of 2,100 c.c., but at present many, and even Dubois himself, still have doubts.

Transvaal Museum,  
Pretoria.  
June 8.

R. BROOM.

<sup>1</sup> NATURE, 143, 511 (1940).

Radioactivity of Be<sup>10</sup>

WHEN beryllium is bombarded with deuterons, a group of protons is observed, with a range of about 26 cm., which is attributed to the reaction  $\text{Be}^9 (\text{H}^2, \text{H}^1) \text{Be}^{10}$ . It has been assumed that the product of this reaction is the species which McMillan<sup>1</sup> found in a beryllium target after prolonged bombardment. Recently, Pollard<sup>2</sup> has reported that the activity in question decays with a period of 350 years. This figure was obtained from the number of protons emitted (which indicates the number of beryllium nuclei formed) and the number of electrons from the decaying substance. Further, the latter author found that the maximum electron energy was about 0.75 Mv.

This high electron energy in combination with the long life at once leads to the necessity that the transition involved is at least doubly forbidden, as one can verify by inspection of the Sargent diagram. If this is so, it leads to the conclusion that the ground states for  $\text{Be}^{10}$  and  $\text{B}^{10}$  are not both *S* states as suggested by Feenberg-Wigner and Hund<sup>3</sup>, unless a  $\gamma$ -ray follows the transition. In order to obtain further information about the radioactivity of  $\text{Be}^{10}$ , I tried to produce it by another method which would allow of its concentration in a small amount of matter. For this purpose boron was irradiated with slow or fast neutrons, which leads either to  $\text{Li}^7$  and an  $\alpha$ -particle, or to  $\text{Be}^{10}$  and a proton.

To make the method as sensitive as possible, about 700 gm. boric acid were placed around a lithium target which was bombarded with 900 kv. deuterons. The  $\text{Be}^{10}$  was separated chemically after 10 mgm. beryllium had been added as carrier. The beryllium oxide was tested inside a counter so designed that even very soft particles could be detected. Since the neutron source emitted, at the voltage used, and for a current of 100  $\mu$  amp.,  $1.8 \times 10^{10}$  neutrons per second, and the total dose was 700  $\mu$  amp.-hours, the total number of neutrons passing through the substance was  $4.4 \times 10^{14}$ . As one electron per second could certainly have been detected, an upper limit for the cross-section of this reaction can be found if Pollard's value for the decay constant is accepted.  $\sigma$  becomes, as calculated from the above figures and the geometry, about  $\leq 2 \times 10^{-28}$  cm.<sup>2</sup>; this representing a mean value for the inhomogeneous neutron beam.